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The 1956 Caribbean Congress

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IT seems a contradiction in terms to speak of the romance of disease. I remember telling a young lady about the transmission of a rabies virus through the bite of a vampire bat, " silently, at dead of night," and referring to it as a romantic disease, to which she replied that it was not her idea of romance : she, however, was a person with a one-track mind and unable to appreciate the broader meaning of the word ; " characterised by a picturesque strangeness," as the dictionary puts it, an association of ideas that bears a pleasure all of its own—and anyone who travels in strange countries in quest of knowledge on disease control, and who allows his perceptions to grope among his store of recollections may find that pleasure for himself.

I was immensely fortunate in having been invited to attend the second Congress of the British Caribbean Veterinary Association and as at last we set off over the Atlantic I thought of the object of such meetings, and of the benefits to be derived. It was a matter of the cross-fertilisation of ideas and I recalled a few lines of modern verse that seemed to fit the situation very well.

> Saw a crate of bees loaded on a train up state
> To fertilise fruit orchards.
> No one has enough bees in his own bonnet
> To fertilise the fruits of his mind.
> Import me a few hives of strange notions
> Mine are too sluggish.

The journey to Jamaica had started with the depression of an anticlimax. After a brave send-off, and after sitting for some time in the plane, listening to the promising roar of the propellers, we were sent back to our homes or hotels because of the low cloud that would prevent our landing at Prestwick. It is only through contrast, however, that we achieve our appreciations, only through cloud and cold that we appreciate the sun, and only through the discomfort associated with a deranged time-table that we appreciate the peace of ultimate arrival. Perhaps it was partly on account of the unhappy start that a blessed calm seemed to settle on everything soon after we left New York. As we went further south the sea and the sky took on a deep violet blue, and the towering piles of cumulus among which we cruised for several hours lent a dream quality to the expedition, so that when we touched down at the tropical island of Nassau, and I saw five dusky labourers under a coconut tree in attitudes of everlasting repose, I knew that I was stepping from the magic carpet, it was so precisely what (some several years ago) I should have expected to see on that Caribbean shore.

It was already dark when I reached the Palisades airport near Port Royal, Jamaica, and was met by Pat Guilbride, the acting Superintendent of Livestock Services, and by Peter Bent, the Honorary Secretary to the Congress. From there they took me 10 miles along the narrow strip of land, lined with cactus towards the sea and mangroves on the harbour side, through Kingston and along another six miles to the Mona Hotel. There, crossing the lawn of some strange, hard-leaved grass, I was greeted by the piping, croaking and drumming of what seemed to be hundreds of frogs, and the stridulations of thousands of crickets ; and there again was the smell of the tropics.

As to what this smell refers, I have never yet discovered. I first sensed it at an airfield near Darwin, in Western Australia, at 3 o'clock in the morning of a very hot season ; it seemed to pervade the whole place, and here it was again in Jamaica; a smell that I have been able to associate only with hot nights in tropical places. I actually enquired of one person about it, a Professor of Zoology. As, however, his only reply was, " What smell ? " I did not pursue the matter further. Presumably it was something only to be sensed through the enhanced perceptions of a new arrival like myself—and, *apropos* of that same point of first impressions, when on more than one occasion I referred to the nocturnal bedlam of the frogs and crickets, people first looked blank and then replied, as though they had recollected something experienced long ago, " Oh, yes ! But when you've been here for a little while you don't notice it any more."

The Mona Hotel was a lovely place. Having one time been the "Great House" of the Mona sugar-cane plantation it stood on the best site on the estate, overlooking the floor of a valley that used to be a sea of irrigated sugar-cane, until the water rights of the Hope river were acquired by the city of Kingston. Since then the area has gone back to the bush, and the "Great House" become an hotel ; an hotel of a peculiarly pleasing character, however, having managed in some way to retain the aura of its domestic past, so that it does not offend the susceptibilities of occasional working visitors like myself. I never found enough time to appreciate the full delight even of that hotel garden, and, to my shame, I never discovered who had been responsible for its layout and for the selection and care of the tropical trees and shrubs, with flowers of brilliant hue and scents that poured down through the branches in the still night air. Nor did I find out who designed the cottages that dropped so naturally into their places in the garden. My own had two doors, one of which was 3 feet and 4 inches from the corner of the swimming pool, and as I lay in bed, I looked through a thin veil of eucalyptus leaves and casuarina, over the valley floor to the steep slopes of the Blue Mountains. From that same point of comfortable contemplation I saw the humming birds, on the first morning, feeding at the blue flowers of the *Lignum vitae* the branches of which hung over my window, and at the scarlet hibiscus. These birds were obviously flower specialists and I considered a little how deep and how practical was their knowledge on the position of the nectary : they knew far more than I did : and that led me to recollections of a woodpecker that I had once reared, a bird that had taught me more about the possibilities of percussion than had any human exponent of the veterinary art.

But my introduction appears to run on too long ; I only wish to say that because of its environment, because of the latitude, and because it was so very far away, and in what was to me such a very foreign place, this was a very special veterinary congress.

Some Congress Details

Nor was it only on account of the environment, the personnel were unusual. P. D. Guilbride, the Acting S.L.S., had paid us more than one short visit at Weybridge, and there were others among the delegates from the smaller islands whom I also knew. There was F. O. Gonzalez, now acting Dept. Director of Livestock Services in Trinidad, who was here in 1954, and P. C. Scoggins from the island of St. Lucia, who paid us a short visit in 1955 ; also H. Charpentier, who had visited Weybridge in 1951 and who, in the absence of Sir Thomas Dalling, might justifiably have claimed to be the most truly international member of the Congress, having such a well-known French name, being of Finnish nationality, speaking English to perfection, rapidly acquiring the Spanish tongue and a Spanish understanding and working for F.A.O. in El Salvador. He would make an excellent veterinary diplomat. Another notable figure was a tall Hollander, Dr. Poelma, from the island of Curacao, and there were two French-speaking delegates, one from French Guiana and one from the island of Guadeloupe. It had been hoped that a Spanish delegation might attend from Cuba, but that did not eventuate. Those invited from abroad to present papers for discussion were Dr. S. J. Roberts from Cornell, Professor A. J. Henderson from Guelph and, from our own country, Professor Robertson, Professor Weipers, H. E. Harbour and myself.

The scientific meetings were held in the lecture theatre of the University Department of Chemistry and were well attended. Beginning with an Open Forum in the form of a Brains Trust—at which the specialists were invited to take what I regarded as a too-prominent position of responsibility—we went on throughout the successive days of the week to discuss papers on nutritional deficiencies, nutrition with reference to production potential, diagnosis of infectious infertility, ovarian dysfunction, parasitic diseases, small-animal surgery and small-animal medicine.

One of the blessings of that tropical country is the trade wind that continues to blow throughout the heat of the day, so that as a result of the many open windows on the two sides of the lecture theatre, and the draught provided by two large fans, we were able to keep reasonably cool, excepting at such times as the windows required to be darkened for the showing of lantern slides, when my northern skin did more than transpire. At night this discomfort was not required, the windows could be left unguarded, and I greatly enjoyed an evening meeting whereat cinema films were shown to the accompaniment of the loud and unceasing babel of frogs and crickets floating through the open windows, and the visual assistance of fireflies, some of them actually inside the lecture theatre.

There is no need here to go into the detail of the scientific papers, as in due course they are to be offered to *The Veterinary Record*. This general account, however, gives me the opportunity of recording other things, such as are often overlooked in the records of scientific gatherings, although they are of the greatest importance : for instance, the pleasing nature of the discussion, which in my experience was never less restrained at any scientific gathering, and never more free from the taint of competition. I saw there what, in my salad days, I had expected always to find in academic circles, a search only for the truth. There seem to me to have been two main reasons for this happy atmosphere : the unusual surroundings on a remote island, and the youthfulness of the majority of the members (which is a purifying thought for one like myself who, in some ways at least, may lay claim to maturity). It is true that the meetings started just a little late, a point that I did not fully understand until towards the end of my stay when I heard two Jamaicans fixing an appointment for 9 o'clock in the morning, and one asking the other whether he meant 9 o'clock British time or Jamaican time. But what did a few minutes matter, or half an hour, lunch could also be a little later than the stated time, and no one would be the slightest bit put out if it were. I am sure that British housewives must change their character when they move to that smooth and easy environment.

An After-dinner Coincidence

The same ease and grace entered into the social side of the conference, first of all at a get-together party at the house of Dr. Guilbride, the S.L.S. This was held in a garden, illuminated from electric bulbs in the

flowering trees and shrubs, where the calypso musicians (to the continuous obligato of crickets and frogs) smoothed out our little differences of language and latitude and prepared the way for the work to follow. A second notable occasion was a luncheon at the Myrtle Bank Hotel in the town, where, while we were being photographed in the garden, I was glad to have the opportunity of watching frigate birds soaring overhead. There was also the official banquet at the Liguanea club ; this, again, out of doors, to the accompaniment of calypsos and followed by speeches. I had been invited for this occasion to reply to the Governor's speech of welcome, and here I was the unfortunate victim of a rather extraordinary coincidence.

For this onerous purpose I had not only turned over the rubble of my recollections for odd scraps of material that, in my opinion, might lessen its natural dullness, but I had deliberately looked for any local pleasantry that could be accepted by our hosts as evidence of the extent of their visitors' appreciation. By this time I had heard mention of " codfish and ackee " as the one dish that was specifically Jamaican ; ackee being a very curious nut, or fruit (it is difficult to decide which is the more descriptive term for this strange product of a tree), resembling in colour and consistency the yolk of a hard-boiled egg, but having a flavour entirely of its own. This dish was somehow regarded as rather a joke, like the hot dogs of our American friends (advertised as " chien chaud " at some of the French-Canadian cafés), only it was even more of a national joke than that—" Jamaica was a little country ; only there could you get codfish and ackee and if you did not try it, then why go to Jamaica ! "—that was the kind of way in which it had appealed to me.

So I worked it up into what I thought was a good after-dinner story. It went something like this : I liked Jamaica very much indeed. I liked it so much, in fact, that I was desperately looking round for some reason, or excuse, for a return. I was pleased to think that I had found one ; I referred to their national dish and asked why not look for a fish of their own to use in place of salted codfish from Newfoundland, they would then have a more truly national dish and, furthermore, would be self supporting. I went on to say that I had had a long research career, and I knew something about fishing, why not give me a three years' grant to make the necessary investigations and so benefit the economy of the island. I took this opportunity of mentioning it in public in the presence of the Minister of Agriculture and Fisheries (he was present at the dinner), as I thought he would then find it difficult to refuse when at last I submitted my request.

I was delighted to find that a few people laughed, whether from kindness of heart or from alcoholic imbibition, I am unable to say, but it seemed to be acceptable as a bit of after-dinner talk. Imagine my chagrin on the following day, however, to find a prominent mention in the daily paper, and to hear that a notable item in the radio news at 6 p.m. on the very night of the dinner had concerned a present shortage in the supply of salted cod from Newfoundland, and that the question had been raised in actual fact, as to whether it might not be possible to use Jamaican fish. Furthermore, that one of the Press reporters present at the banquet had, only with difficulty, been prevented from framing serious headlines for his paper about my proposed researches. It is into dangers such as this that an unwary speaker is led when he endeavours to invent a pleasantry. The coincidence was so extraordinary and the timing so unfortunate that I was left only to console myself with the thought that both the Governor and the Minister of Agriculture must have considered me quick to take advantage of current events.

Travelling " Up Country "

A most interesting part of my stay in Jamaica was that following the Congress, when I travelled through the tropical scenes of that very foreign country in order to observe the conditions under which some of their parasitic diseases occurred. For anyone who has fostered the interest it is a pure delight simply to look about, where every tree, every flower and every bird is strange. Another new thing was the prevalence of lizards ; they were everywhere ; on the walls, on the roofs ; I scanned the tops of coconut trees with my binoculars, they were there too, even at the ends of the 20-foot leaf fronds. They were in my bedroom, and when I handed my B.O.A.C. ticket book to the air hostess on the way back a lizard fell out and nearly caused a panic in the plane.

So I went about on these travels with eager eyes and ears, and with that same pleasure in the association of ideas to which I have already referred. I have mentioned the transmission of paralytic rabies by vampire bats as seeming almost too extraordinary to be real. A recent film for the instruction of farmers had been shown to us during the Congress, when we also heard about an outbreak of rabies among the mongooses on the island of Grenada and of the effective mongoose eradication that had been organised by J. W. Cocozza there. It seemed a romantic idea to think of bats and mongooses acting as reservoirs for viruses that occasionally passed to animals and man ; and there were other strange disease stories. This island had been one of the bad places for yellow fever ; it had been a white man's grave : I saw ruined hospital hutments heavily screened against mosquitoes and I was told of graveyards at Port Royal and other places in the lowlands where " Died of Yellow Fever " was the usual inscription on tombs, and a law, still unrepealed, forbade one to enter because of the supposed danger. This fear of yellow fever must have been the reason for many of the large houses having been built so inaccessibly high in the mountains ; it was also undoubtedly the reason for the position of the old military centre of Newcastle, some 4,000 feet above sea-level—although I preferred the story that I was told about the " Jamaica buttercup " which I saw blooming in profusion along the way to Port Royal and verging many of the lowland roads. As I subsequently learned, from the experts at Kew, this plant *Tribulus cistoides* is a member of the Zygophyllaceae, and in Trinidad is commonly known as the Jamaica Fever plant. By the country folk of Jamaica, however, it is called " kill-buckra " (" Buckra " being an African word for " white man ") because it was thought at one time to be the cause of yellow fever ; and my informant told me that Newcastle was built in its particular elevated position because the " kill-buckra " did not grow there.

And why did it so persistently kill buckra and not kill the black man? The true answer might have come out of a fairy story—it was because the black man was part of the scene, and the black mammy mixed antibodies with the piccaninny's milk, such as cast a spell against the fatal bite of the mosquito and enabled the piccaninny to grow up and make his own protective charm. The white man did not know the secret of this magic. That's why buckra was killed. But it took our "research detectives" a long time to find out, even after they had discovered the implication of *Aëdes aegypti* and his fatal bite—usually in the afternoons. And so we see again that truth is stranger than fiction; more stimulating to the imagination; more romantic.

Reflections on the Microlandscape

A concern with the epidemiology of animal disease and with the ecology of parasites adds greatly to the interest of travel in parts of the earth where domestic animals are managed in ways that differ widely from our own, or where the climate and the landscape provide a new background for epidemiological investigation and the adaptations of parasites are tried to new extremes. As, in the unusual heat and the blazing sun, I went round the various places where my old opponents *Haemonchus* and *Fasciola* were a cause of major trouble, and where *Stephanurus*, the kidney worm of swine, added to the difficulties of the husbandryman, I fell to thinking about the effect of climate and of the details of microclimate. My Australian colleague, H. McL. Gordon, has shown the value of the climatograph by which a graphic representation of the temperatures and humidities of any part of the earth can be plotted along with the parasite's requirements, and an opinion formed as to whether the parasite might be troublesome there or not. The preparation of such a chart for *Stephanurus* shows it to be well suited to Jamaica but unable to thrive in Great Britain, the winter months area of the temperature chart falling outside the requirements of the free-living larvae: but climatography does not tell us everything, and as I travelled round I began to think of landscape: the trained parasitologist can look over an area of country and give a very reasonable account of the parasitic diseases that are likely to occur in the various parts, and if, coming to detail, he finds it useful to consider microclimates, why should he not bring about a similar focus of attentions by the consideration of microlandscapes as well?

It is precisely over that detail that I found myself most at a loss in visiting sites where disease occurred in that tropical country. As an example, I might mention the areas of Guinea grass which is extensively grown for the grazing of cattle. This plant has a very different appearance from our general ideas of cattle feed. I suppose the bases of the leaves to range up to 1 or 1½ inches in diameter and to be a yard in length, projecting stiffly up into the air. The "macrolandscape" was certainly strange but what about the "microlandscape?" How did the climbing *Haemonchus* larvae find their way about that strange forest? How effectively were the larvae screened against the vertical rays of the sun, and to what extent did the heavy dew maintain an adequate level of moisture in the microclimate between those great blades? Furthermore, in such a microlandscape, how far did the grazing bovine avoid the larvae in leaving the giant tufts of woody stubble that still remained even after intensive grazing? Similar questions occurred to me in connection with the dense covering of the newly introduced coastal Bermuda grass (*Cyrodon* sp.). This grass, as also the more usual Pangola grass (*Digitaria decubens*), cannot be grown from seed in the open field but must be planted; ultimately, however, such a dense covering is produced that nothing else has any chance at all. Surely the heavy dews and the dense shade in that microlandscape must create an environment that is ideal for *Haemonchus*?

And what about *Fasciola* and the snail (as yet unknown) that carries *Fasciola*, how does that wily parasite adapt itself to these strange conditions? As I walked over estates where *Fasciola* was a particular cause of trouble—some, where the livers of cattle were almost invariably condemned at the abattoir—I realised even more pointedly, the need for an investigation "on the spot," of these unexplored microlandscapes. On one of these estates the ground was very dry except for three or four waterholes, such as in Jamaica are often seen, surrounded by enormous bamboos. What would our homely *Lymnaea truncatula* think of such vegetable growths as these! Living here somewhere, however, was an indigenous Caribbean snail, doubtless with certain special adaptations, but also doubtless much like *L. truncatula*, so that I was not surprised at its absence from the surroundings of the ponds, as (leaving aside the strangeness of bamboos) the microlandscape was not like the home of *L. truncatula*. It was necessary, therefore, to look farther afield although every other part of the estate seemed dry and hard. In driving about (one does not walk more than is absolutely necessary in such a hot place), and walking only short distances here and there from the car, I learned of the floors of little valleys, where in certain wet seasons it might be necessary to wear gum boots over a period of some three or four months. At the time of my visit, the ground there was as dry as the remainder of the estate, but in one part I could see evidence in the microlandscape of the grass-covered ground, of those parallel ridges that are formed by the repeated stepping of cattle over untrodden ground, or into the footprints of their fellows. Whichever is their aim in so carefully picking their way, I have not been able to ascertain, nor can I quite understand, why the end result should take the form of a series of parallel ridges, but such an effect, often seen, is sure evidence of the previous presence of deep mud of a consistency suited to our mud snail. It seemed to me not unlikely that an investigation of this site would reveal aestivating snails destined to take up their activities once again when wet conditions returned, and which, because of the heat, would reproduce their kind at a rate such as would shame our moderate *L. truncatula* with its mere 25,000 snails from one in the course of 12 weeks. This, however, was another point requiring local investigation. It was again a matter of microlandscape and for those who know the landscape in successive seasons to take up the enquiry and to understand.

The Search for a Fluke Vector

One other interesting part, again involving a very foreign scene, concerned an area of some 50 or more

square miles of swamps where grows another tall grass (*Paricum purpuracens*), up to 3 or 4 feet in height, and in many places standing in shallow water. On our arrival there we found Mr. Browne and his two sons waiting under the shade of a cotton tree, on a rising slope of green grass, with woodland at the top, looking very much like many places I have seen in North Wales or in the Lake District, were it not for the several coconut trees near at hand, and black boys with well-groomed polo ponies in the background, intended for our ride into the swamp.

It was there that the position was explained to me—that the tall grass extending so far in front of us was excellent cattle feed, but the livers of the cattle invariably became badly affected with fluke and were condemned by the meat inspectors (under Dr. Wells, the President of our Congress). After receiving further information of this kind from Mr. Browne, and making my own contribution concerning the ways of flukes and snails, we set out to inspect some of the ground, deciding, reluctantly, on the "Land-Rover" rather than the ponies as means of transport.

The search for *Lymnaea truncatula* is no easy and casual occupation suited to anyone who may wish to spend a pleasant hour; there is more in it than looking for blackberries, and although the landscape and the microlandscape may be full of suggestion to the expert the real investigation of a site is a matter of days or of weeks, even for him. Nor can it be carried out by an uninstructed amateur, no matter how diligent he may be. I knew well enough, from much previous experience, that the numerous water snails described by Mr. Browne as living in the swamp, were as innocent as the butterflies.

There is good reason to believe that the many lymnaean species suited to *Fasciola* throughout the countries of the world have originated from one primeval representative that first agreed to house the parasite. We suppose it was subsequent to this agreement that the continents divided, so that the primitive species thus prevented from intercommunication evolved along slightly different lines in the widely separated countries of the earth. I knew, therefore, that the Jamaican representative could not be so very different from our own, and it seemed to me highly improbable that it would flourish in the permanent water of the swamp. I explained to Mr. Browne, standing waist deep in the swamp grass, that the fluke snail did not like such a place of permanent wetness; it was a creature specially adapted for life in a temporary habitat, with propensities for exceedingly rapid reproduction when it found itself in the proper surroundings. By the same token, however, it had also a great propensity for hanging on from generation to generation in relatively unsuitable environments in which to wait for the opportunity of a population flare-up. In my opinion, therefore, although the fluke snails occurred all over this swampy area, they were present only as small specimens and very sparsely scattered. A casual search in such an area I felt sure would be fruitless; so we proceeded to the marginal ground, where the environment gradually changed from the microlandscape of swamp to that of ordinary pasture. That same region, I knew, would also be the one most subject to occasional inundations such as produce the kind of temporary habitat so favourable to the rapid growth and multiplication of this snail, and also, incidentally, such as ultimately to expose the infected herbage to the grazing animals. I had noticed a number of promising areas as we drove over the field track that led to the swamp and we halted at several of these on our return to the higher ground, and there, sure enough, we found numbers of a lymnaean snail that on naked-eye appearance was indistinguishable from our own *Lymnaea truncatula*.

Time was short, however, and my function only to advise about the kind of investigation that might be taken up by workers whose operational base was less far removed than was mine. These plans were briefly discussed on our way back to the cars during a few happy minutes in which I seemed to be performing my function of imparting a specialised knowledge. Now came along a specialist of another kind, however, in the form of a small negro boy, who at Mr. Browne's indication, climbed a particularly tall coconut tree and, after a little temporary difficulty in circumventing the petioles of leaves (which in itself is rather remarkable) he twisted off a good dozen and sent them thumping down to earth. This boy was no mere theorist; he was able to do things, too; nor did it take long for experts to slash off the ends of the green nuts and to bore holes of convenient size. One aspect of life in Jamaica is that of a continual fight against the dangers of dehydration; it had been hot in the swamp and I was pleased to find the bottle technique (with which I was familiar) to be adequate for the rapid removal of the contents of the nut, and was soon feeling revived. Jamaica rum poured into the nut before drinking is said to make a stimulating beverage, but as we had other places to visit I decided to defer that experience to a later date.

Conclusion

And that is how the tour went. I like to think that it may not have been without its value to my most kind and considerate hosts whom I have now left to put my theories to the test. After all, in my own way I was a specialist, just as much as was the negro boy who climbed the coconut tree. I believe it would take him nearly as long to learn my job as it would take me to learn his. I knew my snails, he knew his coconuts, and the world could not get along without both of us. As Guilbride and I zigzagged along the mountainous roads from one place to another we talked a lot of this and that and I began to appreciate the difficulties of veterinary work in so small and isolated a country as Jamaica. Specialisation as we know it is out of the question, each man having too many things to do, and it becomes necessary for highly developed countries such as ours to provide what help we can. Even a visit of a few days spent in advising on the general lines along which an investigation might most profitably proceed may avoid the misdirection of much effort, and greatly hasten the time when harmful things are brought under control.

It was not, however, until I had a talk with the Minister of Agriculture, The Hon. William Seivright, that I really began to appreciate the nature of the big problems connected with the construction of a livestock

industry in a new and undeveloped country. A Minister's field of operation is the reverse of specialisation—unless one regards him as specialising in the maintenance of a sane balance—and it was good for the soul of a specialist (in some forms of animal disease only) to talk with the man at the head of agricultural affairs, who sees this narrow field as a small part of a whole. Jamaica, as was explained to me, had not yet decided in what direction its agriculture should go. "Beef or bananas?" for instance, was a question still to be decided in so far as their alternative developments might affect Jamaican prosperity. He pointed out to me that sugar cane was of first importance, then came bananas, and cattle a poor third—some of the land now used for beef would grow bananas of three times the value of the beef—should it not do so? Almost all the pig food and the poultry food must be imported—was it not better to grow bananas? Furthermore, with regard to dairy cattle, was there any urgent call for development along that line when the consumption of fresh milk in the island did not amount to more than seven-eighths of a quart per person per year?

These questions were the concern of a specialist in generalities, such as a Minister of Agriculture might be regarded, and not of one whose interests were confined to animal disease. It was a useful reminder, however, of the breadth of the field that must continually be surveyed when engineering the advantageous development of an agricultural industry even in a little country like Jamaica. The federation of the British Caribbean Islands had just been enacted, the last few strokes of the pen having been made less than a week before my interview and the Minister was full of the prospect of new spheres in which to operate, of enhanced opportunities, and of arguments for the siting of the Federal Government House to be—would it be in Jamaica or not? With such high policies in the air it was not easy to keep to the object of my interview; it seemed to be too far a descent to earth. In the end this was effected, however, and we discussed the development of the marginal lands that would not grow bananas but would grow beef, and the health of the stock that might be reared there. The need for a certain amount of specialisation among the veterinary staff and for the provision of a well-equipped laboratory was emphasised, and for workers who were expert in the techniques that are peculiar to such places. Arrangements for two of the existing members of the service to visit Weybridge were also discussed, one professional man and one senior technician, as only a beginning, and I felt that the object of my interview had, at least, been partially achieved.

This was my last day in Jamaica. The next day I flew to New York, where it was insufferably hot. On the following day we crossed the Atlantic. There, on the eastern side, we pierced the deep and wide blanket of cloud, from the sunny side down, and saw the little fields so well watered and so very green. At Prestwick it was windy, wet and cold; I was stepping from the magic carpet once again. The delightful interlude in a parasitologist's life was over. That the recollection should fade is inevitable, but the flavour and the colour of the experience will remain unchanged for a longer time than mots dreams are remembered.

Copper Poisoning in Sheep Following the Feeding of a Copper-supplemented Diet

BY

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Introduction

OVER 70 years ago Ellenberger & Hofmeister (1883) recognised that sheep were unable to tolerate relatively small quantities of copper sulphate. Cunningham (1950) refers to the marked difference between cattle and sheep in their ability to excrete copper, 5 grammes a day being tolerated by the former, and 1½ to 2 grammes a day being fatal within 30 days for most British breeds of sheep.

The problem of copper intolerance is continually a very big problem in sheep in Australia where co-ordinated research into the situation has been going on since 1936. The two forms of copper poisoning recognised there, however, heliotrope poisoning and chronic copper poisoning, are peculiar to Australasia and are unlikely to arise in similar form in Europe.

The present cases of poisoning are recorded with a view to re-emphasising the susceptibility of sheep to copper, and to show that sheep may die several months after its administration in accumulative doses. Losses were not in any way spectacular in the outbreak, only four sheep being lost out of a total of 164: but the delayed form of the disease, and the unsuspected source of the copper, are perhaps worthy of record.

Fattening piglets have recently been observed to demand larger doses of copper than are normally fed, and it has now been established that 250 parts per million, *i.e.* 35 to 50 times as much as is normally given in the feed, improves the rate of growth and food utilisation. This amount of copper is obtained by the addition of 0.1 per cent. of copper to the ration, and ignorance of the fact that a diet containing such a high percentage of copper is unsuitable for sheep led to the present outbreak.

Sheep were of secondary consideration on the farm referred to here, but were nevertheless well attended and well fed. The pig farm received a meal ration prepared by mechanical mixer on the farm. This contained bran, maize, barley, and grass meal, and to each 14 cwt. meal mixture were added 2 lb. of lime, 2 lb. of salt, 1 lb. of copper sulphate, and 9 lb. of a vitamin product. An approximate percentage of .07 per cent. copper sulphate was thus present in the ration.

Feeding Programme

The above mixture was continuously fed to the sheep—a flock of 164 Cheviot ewes—between the middle of December, 1954, and the second week in April, 1955. It was fed at the rate of 1 lb. per head per day at first, increased to 1½ lb. per head in January, and to 2 lb. per head for about three weeks in February when the weather was unduly severe.

The sheep were fed in open troughs and grazed throughout on three fields of 30 acres, 30 acres, and 40 acres respectively, and consisting of good quality mixed grasses and clover. River water was freely available for drinking.

Course of the Disease

Lambing commenced on March 17th, and no complications developed until May 3rd, when an in-lamb ewe died within a few hours of being seen with acute symptoms of jaundice. It was given no treatment and a *post mortem* showed the following principal changes:—

Extreme jaundice of all body fat and tissues was present, the liver being enlarged, orange-yellow in colour, and very friable. The kidney change was marked, each kidney being enlarged through engorgement with blood and very dark in colour. The spleen was similarly engorged, pulpy and darkened in colour, and the urinary bladder contained a deep-red urine containing whole and lysed blood. Some old pneumonic changes were present in each lung but were not considered of relative importance. Petechiae were found on the myocardium.

A second ewe died two days later, and a third on June 6th, both showing similar *post-mortem* appearances following an acute and fatal illness. On September 6th, *i.e.* almost five months since any copper feeding had been given, a fourth ewe died in the same way. All four carcases were in excellent nutritional condition.

Diagnosis

Copper poisoning was not at first suspected following the first death, and some disappointment was felt when biological, cultural and microscopical tests for leptospiral infection proved to be negative. Jaundice in sheep was not a common feature in routine *post mortems*, and by chance only was copper poisoning suspected. Liver analyses were carried out in three of the cases by the Biochemical Department, Weybridge Laboratories and copper values found to be as follows:—

Case 2—1,400	parts	per	million—dry	matter.		
Case 3—1,900	,,	,,	,,	,,	,,	
Case 4—1,400	,,	,,	,,	,,	,,	

These figures are much greater than normal and are consistent with the copper poisoning syndrome in sheep.

The fields were visited on several occasions in an effort to trace the source of copper but no copper medicines had been given, no orchards existed, and no source of copper other than the winter feeding was found to have been possible.

Bacteriological tests on liver, spleen, kidney, and heart blood were carried out on each ewe and yielded no infections of significance.

Histology of the liver, kidney, and spleen was carried out on three of the carcases only, and a summary of the report given by Mr. J. T. Baxter is as follows:—

Liver. In each case marked fatty changes existed. Many lobules showed central necrosis and some an early fibrosis. In others the fibrous change was more advanced and to some degree a pericellular deposition was found. Vascular congestion of the liver tissue was most marked in Case No.4, where central necrosis was present in every lobule. The hepatic cells were slightly larger than normal.

Kidney. Many glomeruli were distended and others somewhat contracted as if by the pressure of a granular eosinophile fluid lying between the capsules and the tuft. Many of the convoluted tubules were dilated with the fluid and free blood cells were present. The fluid in the straight tubules of the medulla was more granular and the epithelium of some of the smaller tubules in the cortex was disintegrating.

Spleen. Congestion of the organ with blood was the main feature.

A diagnosis of haemolytic jaundice as a result of copper release from the liver, was made following the biochemical results taken in correlation with the history and *post-mortem* findings. The source of copper was the winter feed containing 1 lb. $CuSO_4$ per 14 cwt. mixture and fed from mid-December for a period of three and a half months.

It was estimated that each pound of meal contained 0.3 gramme $CuSO_4$ and that on a 2 lb. per head basis —as in February—the average amount of copper sulphate taken by each sheep each day was 0.6 gramme. A greedy sheep could perhaps have taken double this amount during that month, and proportionately less in January and March.

Liver Copper Values of Normal Sheep

Following the third death on June 6th it was decided to follow up, if possible, the liver copper values of any sheep likely to be culled. Seven barren ewes were selected by the owner and slaughtered on June 28th, the biochemical tests again being carried out at Weybridge. Their results were as follows:—

Identification No.	Liver Copper p.p.m./DM.
1	1,300
2	530
3	700
4	400
5	400
6	780
7	190

The values cover a wide range but fall within Cunningham's range for normal aged ewes—except perhaps that of No. 1. This is at the higher end of the normal scale and "could represent a potential case of copper poisoning under stress conditions."

An even lower value—180 p.p.m. per DM.—was found in the liver of a sheep which died from an enterotoxaemia on September 15th. This sheep had been bought in during the summer and had received no copper feed.

Discussion

Ogilvie (1954) described a case of copper poisoning in ewes and lambs in which death, in some cases, was delayed for two and a half months following the spraying of an orchard with cuprous oxide. He

estimated that up to 1 gramme of copper per day could have been ingested by the grazing sheep. Hopkirk (1938) in New Zealand estimated experimentally that 1 gramme of $CuSO_4$ given daily would kill sheep within one to two months, while Eden (1940), Ellenberger (1883), and Cunningham (1950) have estimated 0.5 to 2 or 3 grammes a day to be toxic. The accumulative dose of $CuSO_4$ in the present outbreak is thus well within the toxic range.

Clegg (1956) discusses the use of a mineral supplement containing copper sulphate and leading to deaths in sheep from copper poisoning, but the copper doses thus available were very low indeed. At the rate of 5 grammes supplement given each animal per week less than 1.5 grammes $CuSO_4$ was available per head in a complete year. An anthelmintic dose containing possibly 1.5 grammes $CuSC_4$ per animal was given 10 days prior to the first death and was probably the main source of copper responsible for the deaths that followed.

Stress as an influencing factor following copper accumulation has not been referred to by many writers. Grayson (1949) in Victoria suggests that it leads to derangement in the normal function of the liver and indirectly is responsible for the release of copper. In 1952 the Australians proved to their satisfaction that the strain of travelling was an important factor in promoting the haemolytic crisis, and Allcroft (1955) considers forms of stress such as starvation after good feeding, exposure to cold, and sudden unaccustomed exercise, to be important predisposing factors leading to liver copper release. She has noted that sheep are capable of storing dangerously high amounts of copper in the liver when fed a concentrate ration.

The factor initiating copper release in the present outbreak was thought to be excessive movement of the sheep a few days prior to the first two cases, shearing of the sheep before the third case in June, and again movement of sheep several days before the fourth case in September.

The nutritional condition of the sheep was in each case good. Other workers have found this to be the case, *e.g.* Ogilvie (1954); while a few, *e.g.* Fincham (1945), have found the opposite, and have suggested that sheep in better conditions are less liable to succumb.

Grayson (1949), Muth (1952), Boughton & Hardy (1934), and others, give good descriptions of the *post-mortem* findings following the acute copper-poisoning crisis. The liver, kidney, spleen, and generalised icterus changes found in the present outbreak agree in almost all respects though bowel haemorrhage was not found as is often the case in Australian casualties. The " gun-metal " appearance of the kidney was found and together with the haematuria, the liver changes, and generalised jaundice of the carcase, present a characteristic *post-mortem* picture following acute copper intoxication.

The source of copper was not apparent to the owners, and in this day of trace element correction and the use of mineral mixtures in feeding-stuffs, was in no way considered to be dangerous. The peculiar susceptibility of sheep to poisoning by copper salts is generally not known among farmers and indeed scientific workers have much to learn about the ability of sheep to store copper and the factors associated with its accumulation and elimination from the liver.

Lewis & Allcroft (1953) have already observed in Britain that the nature of the diet affects liver copper storage in the ewe, and Allcroft & Lewis (1956) refer to the copper/molybdenum ratio and its influence. Their observations have so far been concerned mainly with copper deficiency problems rather than with those of copper intoxications, but nevertheless they give valuable information on some of the factors influencing storage ability and the elimination of copper from the body.

Summary

Four acute cases of copper poisoning are described in a flock of 164 cheviot ewes. Liver copper values are recorded, together with *post mortems* and histological findings. The source of copper was a mineral-supplemented feed, given for three and a half months during the winter months; the first two deaths occurring three weeks after feeding had stopped. The third death took place after eight weeks, and the fourth after five months.

The liver copper values of seven apparently normal sheep in the flock are estimated, one being found to contain 1,300 p.p.m. per DM.

The influence of stress in promoting the haemolytic crisis is discussed.

Acknowledgments.—Primarily to Mr. P. S. McBride, M.R.C.V.S., of Antrim for bringing the cases to our notice; also to the members of the Veterinary Research Division, Stormont, who gave technical and professional help, and to the staff of the Biochemistry Department, Veterinary Laboratory, Weybridge, for carrying out liver copper estimations.

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The Value of Nitrofurazone in Experimental *Eimeria tenella* Infection of Chickens

BY

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Introduction

DAVIES & Kendall (1955) reported three experiments on the value of nitrofurazone in *Eimeria tenella* infection of chickens. Their first two experiments compared sodium sulphadimidine medication, commencing 48 hours after infection, with nitrofurazone medication, commencing 48 hours before and 48 hours after infection. They found that nitrofurazone had a definite coccidiostatic effect but was much less effective than sodium sulphadimidine. From their third experiment they concluded that chickens fed continuously on a diet containing 0.01 per cent. nitrofurazone did not develop immunity following inoculation with 800 sporulated oocysts; when challenged with 100,000 oocysts the treated chickens suffered heavier mortality (30.7 per cent.) than the untreated controls (17.3 per cent.).

These results seemed inconsistent with those of Harwood & Stunz (1949a, 1949b and 1950), and those of Horton-Smith & Long (1952). It was decided therefore to repeat the first and third experiments of Davies & Kendall (1955).

Comparison of Sodium Sulphadimidine with Nitrofurazone

Experiment. Cross-bred Australorp-White Leghorn day-old chicks were bought from a commercial hatchery, and reared in electrically heated battery brooders. They were fed on an all-mash diet containing 33 lb. wheat meal, 20 lb. maize meal, 16 lb. pollard, 16 lb. meat meal (45 per cent. crude protein) and 15 lb. of a commercial preparation, chiefly skim-milk powder, containing 31 per cent. crude protein. Anhydrous manganese sulphate, synthetic riboflavin and stabilised vitamins A and D_3 were added to give manganese 88 p.p.m., riboflavin 5 p.p.m., vitamin A 2,800 I.U. per lb., and vitamin D_3 280 I.U. per lb.

The chickens were kept on wire-mesh floors throughout the experiment. They were wing-banded at seven days of age and weighed, then randomised into four groups, each of 30 chickens, at 14 days of age. Three days later each chicken was inoculated with 40,000 sporulated oocysts of *E. tenella* given directly into the crop. One group was treated with 0.2 per cent. sodium sulphadimidine in the drinking water for five days; two groups were treated with 0.0196 per cent. nitrofurazone in the feed for seven days, and one group received no treatment. Medication in each instance started two days after inoculation. Feed and water intakes were measured daily from the time of inoculation.

The chickens were weighed the day before inoculation, and on the third, fourth, fifth, sixth, seventh, and tenth days after inoculation.

Results. The number of deaths in each group is shown in Table I. Fifty per cent. of the untreated chickens died; the deaths occurred on the fifth, sixth, and seventh days after inoculation. No deaths occurred in the groups given nitrofurazone and sodium sulphadimidine.

TABLE I

NUMBER OF DEATHS IN GROUPS OF CHICKENS GIVEN SODIUM SULPHADIMIDINE AND NITROFURAZONE COMMENCING 48 HOURS AFTER INOCULATION WITH 40,000 SPORULATED OOCYSTS OF *E. tenella*

Treatment	Number in Group	Number of Deaths
Nil	30	15
Sodium sulphadimidine 0·2 per cent. in water	30	0
Nitrofurazone 0·0196 per cent. in mash	30	0
Nitrofurazone 0·0196 per cent. in mash	30	0

The growth curves are shown in Fig. 1. The group given sodium sulphadimidine gained only 7.7 g. per chicken while being treated, whereas the two groups on nitrofurazone gained respectively 17.5 g. and 21.4 g. per chicken during the same period. This is attributed to the drinking water medicated with sodium sulphadimidine being alkaline *p*H 9.35 and unpalatable. When the drug was added, water and feed intake dropped 30 per cent. Normal weight gains were resumed immediately the drug was withdrawn.

The Effect of Continuous Medication with Nitrofurazone on the Development of Resistance

Experiment. Cross-bred Australorp-White Leghorn day-old chicks were bought from a commercial hatchery and reared in electrically heated battery brooders. They were fed on the all-mash diet already described. The chickens were wing-banded at nine days of age and weighed, then randomised into 20 groups of 10 chickens at 16 days of age. Ten groups were then fed on mash containing 0.011 per cent. nitrofurazone, and the other 10 groups were fed on unmedicated mash. Eighteen days later each chicken was inoculated with 800 sporulated oocysts of *E. tenella*. On each day thereafter one control group and one group fed on nitrofurazone-medicated mash were challenged with 55,000 sporulated oocysts.

Deaths were recorded until the 10th day after the last challenge inoculation. The numbers of oocysts passed in the faeces on the eighth, ninth, and tenth days after the initial inoculation of 800 oocysts were counted in those groups not yet challenged, *viz.* groups H, J and K. The oocysts in the faeces of

group H were counted on the eighth day, those of group J on the eighth and ninth days and those of group K on the eighth, ninth, and tenth days. The oocysts passed by each group on the eighth, ninth and tenth days after challenge were also counted. Oocyst counts were done on the 24-hour output of faeces for the group by the method of Farr & Allen (1942), slightly modified.

FIG. 1.—Growth curves of chickens inoculated with 40,000 sporulated oocysts of *E. tenella*. The breaks in the curve for untreated controls show where deaths occurred, the upper points on the fourth, fifth and sixth days being the mean weight of the chickens that survived to the following day. The weight given at the end of each curve is the mean weight gain per chicken from day −1 to day 10.

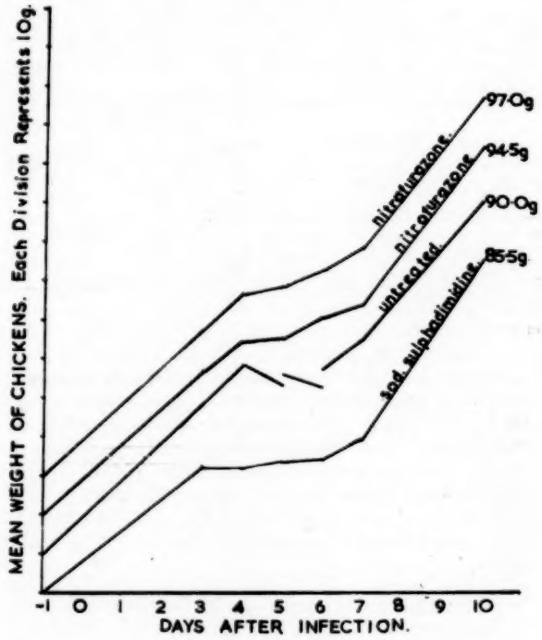

FIG. 1.—The Value of Nitrofurazone in Experimental *Eimeria tenella* Infection.

Results. The number of deaths in each group is shown in Table II. Mortality in the nitrofurazone-fed groups was neglible, one chicken dying in the first and third groups to be challenged. Heavy mortality occurred in the first untreated group to be challenged, but resistance then became evident, and only two more chickens died.

The oocyst counts in Table III show high counts in the untreated and negligible counts in the treated groups on the eighth, ninth and tenth days after the initial inoculation with 800 oocysts.

Table IV shows a progressive decline in the oocyst count as immunity developed in the untreated groups. The nitrofurazone-treated groups showed much lower counts, which became negligible in the groups challenged 96 hours and later after the initial infection.

Discussion

In the first experiment, nitrofurazone 0.0196 per cent. in the feed and sodium sulphadimidine 0.2 per cent. in the drinking water both prevented mortality from coccidiosis when given two days after inoculation of oocysts. Davies & Kendall (1955) found that sodium sulphadimidine (0.2 per cent.) prevented mortality from an inoculation that caused 28 deaths in a group of 30 untreated chickens, and 28 deaths from 60 chickens in two groups fed 0.0196 per cent. nitrofurazone. Cuckler & Malanga (1955) found that 32.5 per cent. of 40 strains of coccidia from "problem" flocks throughout the U.S.A. were resistant to nitrofurazone, so that the possibility that the strain used by Davies & Kendall was similarly resistant cannot be overlooked.

TABLE III

OOCYSTS PRODUCED AFTER INOCULATION OF 800 SPORULATED OOCYSTS. EXPRESSED AS MILLIONS PER CHICK PER DAY

Group	Days after inoculation		
	8th	9th	10th
1. 0·011 per cent. nitrofurazone			
H	< 0·9		
J	< 0·9	< 0·9	
K	< 0·9	< 0·9	< 0·9
2. Untreated			
H	35·1		
J	29·9	16·2	
K	18·9	20·4	4·0

TABLE IV

OOCYSTS PRODUCED AFTER CHALLENGE WITH 55,000 SPORULATED OOCYSTS. EXPRESSED AS MILLIONS PER CHICKEN PER DAY

Group	Days after inoculation		
	8th	9th	10th
1. 0·011 per cent. nitrofurazone			
A	5·0	2·1	1·0
B	3·1	3·9	0·7
C	2·1	2·0	< 0·6
D	< 0·6	< 0·6	< 0·6
E	< 0·6	< 0·6	< 0·6
F	< 0·6	0·6	0·6
G	< 0·6	0·6	< 0·6
H	1·8	0·6	1·1
J	< 0·6	0·7	< 0·6
K	2·8	0·7	< 0·6
2. Untreated			
A	55·0	15·7	1·0
B	29·2	48·3	6·8
C	40·5	4·2	7·4
D	33·1	13·4	7·4
E	24·5	18·7	7·8
F	13·5	3·5	4·3
G	< 0·6	5·4	< 0·6
H	3·1	4·5	1·4
J	26·7	14·2	10·7
K	6·4	7·5	3·1

TABLE II

DEATHS IN NITROFURAZONE-TREATED AND IN UNTREATED CHICKENS WHEN CHALLENGED WITH 55,000 SPORULATED OOCYSTS FOLLOWING INITIAL INOCULATION WITH 800 SPORULATED OOCYSTS

Days after initial inoculation	Group 1—100 chicks receiving 0·011 per cent. Nitrofurazone continuously in the mash										Group 2—100 chicks No treatment									
	A	B	C	D	E	F	G	H	J	K	A	B	C	D	E	F	G	H	J	K
1	•										•									
2		•										•								
3			•										•							
4				•										•						
5					•						1†				•					
6						•										•				
7	1						•				7						•			
8								•				1						•		
9			1						•				1						•	
10										•										•
11																				
12																				
13																				
14																				
15																				
16																				
17																				
18																				
19																				
20																				
Total	1	0	1	0	0	0	0	0	0	0	8	1	1	0	0	0	0	0	0	0
mortality	2										10									

• Challenge inoculation with 55,000 sporulated oocysts.

† Cause of death was not determined at autopsy.

In the second experiment resistance developed quickly in the untreated chickens; none died from challenge inoculations at 96 hours or later after the initial infection. This agrees with the observations of Kendall & McCullough (1952), who found that resistance was developing at 72 hours, and by 96 hours was as strong as at eight days after infection. Development of immunity is shown also by the progressive decline in the numbers of oocysts passed on the eighth, ninth and tenth days after challenge inoculations (Table IV).

Deaths were almost entirely prevented by nitrofurazone. This must be attributed chiefly to the therapeutic effect of the drug. However, that immunity was developed in the medicated groups is shown by the progressively declining oocyst counts shown in Table IV. In the groups challenged on the fourth and subsequent days after the initial infection, few or no oocysts were detected.

All coccidiostatic drugs that act late in the life cycle should allow the development of immunity. As resistance is building up by 72 hours after infection, the developmental stage necessary for the production of immunity is one that develops before this. Nitrofurazone, even when used at optimal concentrations, allows some damage to caecal mucosa as shown by the passage of blood. The developing second generation schizont is responsible for this damage (Tyzzer, 1929), so nitrofurazone must act on a stage no earlier than this schizont.

Davies & Kendall (1955) drew the conclusion that nitrofurazone prevented the development of immunity. However, when medication is continued through the challenge inoculation, it is impossible, if mortality alone is the criterion, to separate the effects of immunity and medication. In our experiment, where oocyst production and mortality were used as criteria, immunity was developed quickly by the nitrofurazone-treated chickens. Nevertheless it is difficult to understand why Davies & Kendall lost more nitrofurazone-treated chickens than untreated controls. Had they been using a nitrofurazone-resistant strain, which seems possible from their first experiment, the pattern of deaths in both groups should have been similar.

Summary

Two experiments on the value of nitrofurazone for *E. tenella* infection in chickens are reported.

In the first experiment both nitrofurazone and sodium sulphadimidine prevented death from an infection that killed 15 of 30 untreated chickens.

In the second experiment, 20 groups each of 10 chickens were all inoculated with 800 sporulated oocysts. Ten groups were given 0.01 per cent. nitrofurazone continuously in the feed and 10 groups received no treatment. Each day after the initial inoculation a sub-group of 10 chickens from each group was challenged with 55,000 oocysts. In the untreated group eight chickens died, and in the treated group two died. The pattern of deaths and the numbers of oocysts in the 24-hour output of faeces showed that immunity developed in both groups within 96 hours of the initial infection.

(*Concluded at foot of col. 1 overleaf*)

The American Veterinary Medical Association Convention

BY

A CORRESPONDENT

This, the 93rd annual meeting, was held in San Antonio, Texas, from October 15th to 18th, being followed by an adjourned session at the National School of Veterinary Medicine and Zootechnics, University of Mexico, Mexico City. There were 2,700 delegates present.

Before the official opening of the Convention pre-conference sectional meetings were held, and covered the full scope of the Association's activities. Among the subjects discussed were the reports of standing committees on education, research, ethics, legislation, biological products, therapeutic agents, public relations, poultry diseases, parasitology, nutrition, pathology, etc., and the reports of special committees on academic standards, animal reproduction, artificial insemination, brucellosis, diseases of wild and fur-bearing animals, emergency advisory services, insurance, laboratory animals, motion picture and television nomenclature of diseases, public health, zoonoses, etc.

The Association's appreciation of the importance of public relations was characterised by a whole day being set aside to discuss as fully as possible the ways and means of increasing American awareness of veterinary activities via press, radio, television, and other media.

During the opening session, under the chairmanship of President Floyd Cross, greetings and good wishes for a successful convention were transmitted on behalf of the President, Council, and members of the B.V.A. to the A.V.M.A.

The principal address, " Tissue Culture in Experimental Biology and Medicine," by Dr. C. M. Pomerat, illustrated the close liaison between the medical and veterinary professions in certain branches of research. After this opening paper the Convention split up, to hear sectional papers on general practice, surgery and obstetrics; public health; poultry research, and small animals.

Some of the sessions, for example those on surgery and artificial insemination, were successfully relayed by television to the auditorium.

In only a few cases were discussions held after the papers. The papers themselves are to be published in the J.A.V.M.A. and J.A.V.R., and not, as formerly, in a brochure of collected papers. No paper seemed to mark positive advances in veterinary medicine or surgery, but each was interesting. The technical films were all excellent. The last session at San Antonio was devoted to one of a series of sponsored films for television. These, a novelty in British eyes, are drawn up with the aid of the California Veterinary Medical Association to show weekly to the viewing public some of the day to day problems of veterinary practice. Such television films are in the form of stories and have considerable popular appeal.

On the Thursday the Convention moved from San Antonio to Mexico City where the incoming A.V.M.A. President, Brigadier-General Wayne O. Kecher, was installed.

Associated with the Convention were commercial and scientific exhibitions. The commercial exhibition was well designed so that members going to papers or to coffee passed through the exhibition. The scientific exhibits were extremely good, covering viral inclusion bodies, disease-carrying insects, blood circulation ligation aids, meat inspection, leptospirosis in man and animals, specialised surgical procedures and bone pathology, sylvatic rabies, veterinary medicine in Air Force research, echinococcosis in man and animals, poultry inspection.

The Value of Nitrofurazone in Experimental *Eimeria tenella* Infection of Chickens—*concluded.*

These results are at variance with those reported by Davies & Kendall, and from which they concluded that 0.0196 per cent. nitrofurazone proved markedly less effective than 0.2 per cent, sodium sulphadimidine in reducing mortality, and that 0.01 per cent, nitrofurazone interfered with the development of immunity.

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TOO INGENIOUS

Magistrates at Tavistock juvenile court recently, had before them a boy of 16 who had found an illicit way of getting a lift home late at night after indulging in some other doubtful activities. Using the name of a farmer, he telephoned a local veterinary surgeon asking him to make an emergency visit to some supposedly sick cattle. When the veterinary surgeon's car came along, the youth " thumbed " for a lift and was obligingly taken all the way home.

Naturally the hoax was discovered, and so also was the fact that the boy had been guilty of minor theft. He was sent to a remand home " for medical examination." It seems reasonably safe to forecast that there is nothing much wrong with his head.

Current Literature

ABSTRACTS

Zoonoses as a Study in Ecology. HEISCH, R. B. (1956). *Brit. med. J.* September 22nd, 1956. 669-73.

The author of this paper is Senior Parasitologist, Division of Insect-Borne Diseases, Medical Research Laboratory, Kenya.

The paper opens with a discussion on the definition of the term zoonosis. The writer suggests that zoonosis might be defined as " infections of man naturally acquired from other vertebrates " and indicates that this definition is preferable to that of the World Health Organisation, namely " those diseases which are naturally transmitted between vertebrate animals and man "; the point at issue being the use of the word disease, which perhaps ought to be avoided, as in certain zoonoses one or more of the vertebrate hosts may show no symptoms of disease.

A section of the paper is devoted to evolution and the zoonoses which can be traced as follows. First the parasite lives happily, passing between its animal host and the arthropod vector; next, man breaks into the cycle and accidentally becomes infected; the parasite flourishes in this abnormal host and may be transmitted by a more domestic vector—for example, flea or louse. The disease then often assumes an epidemic form, and may pass from man to man.

Attention is then paid to the holistic tendency in nature. Briefly, the conception of a zoonosis is complex and includes environment as well as man, animals, and sometimes arthropods, and a causative organism, the various parts forming a biological whole.

There is an interesting section on the zoonoses and ecology. There are two approaches to ecology, which has been defined as " the study of interrelation between organisms and the environment," these are the synecological and the autecological. Synecology is synthetic or holistic in character, the various plants and animals in a community being treated as a whole. Autecology deals with single organisms or species in relation to environment; it is not real ecology at all. The early work on plague in Kenya reveals the limitations of an autecological approach. Everyone was so convinced that the domestic rat was the reservoir host that it was considered in isolation and not sufficiently in relation to the wild rodents which are the real source of infection. " The working out of the life-histories of arthropods in the artificial atmosphere of laboratories also verges on autecology, and, though such studies have a certain value, they can never replace work in the field."

The host-parasite relationship receives extended consideration. This is defined as the nature of the interaction between the host and the parasite. It is suggested that the most important reservoirs of zoonoses and other parasitic infections are relatively insusceptible animals rather than highly susceptible ones. In 1926 Dr. Wenyon wrote: " Whenever a parasite is discovered which brings about the death of its host in a short time, it may be safely assumed that the host is not a natural one, or that it is a natural one that is in some unnatural condition. After a time adaptation may occur and a host that was at first an unnatural one may gradually become a natural host."

There are various kinds of host. Resistant or relatively insusceptible hosts might be termed " permanent hosts," high susceptible hosts might be termed " temporary hosts." These two terms correspond to Wenyon's natural and unnatural hosts. Hosts can also be classified as " domestic " or " wild." The reservoir of a zoonosis is seldom just one animal, but usually includes several species, which are in close ecological association and act as a " zoological complex " or " biological whole."

Resistant and unduly susceptible animals fill different " niches " in nature. Important niches are filled by the vectors of zoonoses.

The focal distribution of zoonoses in nature may be determined by the distribution of the arthropod vector, and that in turn may be governed by ecological factors which as yet are not fully understood. Man, by altering the distribution of vertebrate animals and by cultivation of the ground may change the ecological position in either direction, that is to say, a zoonosis hitherto present may disappear or conditions may become favourable for the appearance of a zoonosis hitherto unknown in the area.

Zoonoses are transferred to man and other vertebrates in a variety of places, for instance, clearings in scrub, areas of secondary vegetation, native huts, village maize cribs, caves, and burrows.

A study of what ecologists call " food-chains " and " food-cycles " is an important aspect of the synecology of the zoonoses. Animals linked by food form food-chains and all the food-chains in a community form the food-cycle.

In an animal community herbivores are preyed on by carnivores, which in turn are preyed on by larger carnivores until theoretically an animal is reached which has virtually no enemies. The animals at the base of the chain are smaller and more numerous than those at the top. This has been termed the pyramid of numbers. It has been suggested that parasites are really small carnivores, though often they do not kill their prey.

The size of animal communities fluctuate greatly and this must be taken into account when studying the zoonoses. For instance, at Rongai, outbreaks of plague usually coincide with a remarkable increase in the wild rodents; when their numbers drop, which often happens quite suddenly, the link with the domestic rats is temporarily broken and human infections cease for the time being.

G. F. B.

The Destruction of Tubercle Bacilli in Milk by High Temperature Short-Time Pasteurisation. Report, Public Health Laboratory Service. (1956). *Mon. Bull. Minist. Hlth. Lab. Serv.* **15.** 232-7.

Although both the " holder " method of pasteurisation, in which milk is held at a temperature of 145° to 150° F. for at least 30 minutes, and the " high temperature short time " (H.T.S.T.) method, in which milk is heated to at least 161° F. for at least

15 seconds, are officially recognised in Great Britain, doubts are sometimes expressed as to the reliability of the latter method. The present report gives details of an investigation of this point by 22 public health laboratories. It states that whereas 8 out of 725 (1.1 per cent.) samples of milk treated by the holder method were shown, by guinea-pig inoculation, to contain viable tubercle bacilli, only 1 out of 3,600 (0.3 per cent.) treated by the H.T.S.T. method was infected, and that this single failure was due not to faulty pasteurisation but to contamination at the bottling stage. Because of the method by which the samples were selected for biological examination, these figures cannot be used to calculate the true incidence of tubercle bacilli in pasteurised milk, but they provide a comparison of the efficiency of the holder and H.T.S.T. methods of pasteurisation, and it is concluded that the latter method is the more satisfactory.

The chances of tubercle bacilli being present in pasteurised milk, particularly that treated by the H.T.S.T. method, are evidently very small, but the authors state that samples of milk giving a positive reaction to the phosphatase test occur sufficiently often to justify a more stringent control of the processing plants.

Oral Transmission of *Histomonas* in Turkeys. LUND, E. E. (1956). *Poult. Sci.* **35.** 900-4.

The experiments reported by the author suggest that even under the most favourable conditions the ingestion of unprotected *Histomonas* organisms (*i.e.* histomonads that are not protected within the eggs of the caecal worm *Heterakis*) is unlikely to produce clinical blackhead infection in turkeys. It is possible, however, that the ingestion of unprotected histomonads by turkeys that are already carrying *Heterakis* worms may cause them to become carriers and disseminators of the disease.

Studies on the Chemoprophylactic Action of Furoxone against Infectious Enterohepatitis (Blackhead) of Turkeys. COSTELLO, L. C., & DEVOLT, H. M. (1956). *Poult. Sci.* **35.** 952-5.

The use of furazolidone in the food at the rate of 0.011 per cent., 0.0167 per cent., or 0.033 per cent. completely prevented the development of clinical blackhead in poults exposed to contaminated soil. Some subclinical infections occurred, but these were fewer when the higher dosage rates were used. The use of 0.011 per cent. or 0.033 per cent. furazolidone for the five-week period of the experiment did not significantly retard the growth rate, but there were indications that the higher level might do so if fed for a longer period.

E. A. G.

TRIPLETS

A Friesian cow belonging to Mr. A. Hollinshead of Polefields Farm, Lichfield, has given birth to triplets following artificial insemination.

News and Comment

THE 1957 HEALTH CONGRESS

The Royal Society of Health announce that Professor L. P. Pugh, President of the Royal College of Veterinary Surgeons, has accepted office as President of the veterinary hygiene section of the Society's 1957 annual congress. This takes place in Folkestone from April 30th to May 3rd.

THE STEPHEN PAGET MEMORIAL LECTURE

The Research Defence Society announces that the 25th Stephen Paget Memorial Lecture, entitled "Resistance to Infection: The Experimental Approach," will be delivered by Professor A. A. Miles, C.B.E., M.D., F.R.C.P., on Tuesday, November 27th, at 5.30 p.m. in the Physiology Lecture Theatre, University College, Gower Street, London, W.C.1. Members of the profession are invited to be present.

THE AYRSHIRE DIVISION

We are asked to announce that, for the year 1956-7, the President of the Division is Mr. A. A. Young, 10, Charles Road, Ayr, and the Hon. Secretary and Treasurer is Mr. A. L. Wilson, Veterinary Investigation Department, West of Scotland Agricultural College, Auchincruive, Ayr.

AGRICULTURE IN THE BRITISH ECONOMY

A conference, having the above title, has been arranged to take place in Brighton on November 15th, 16th and 17th. It will be attended by invited agricultural and industrial delegates, and has the approval of the Ministry of Agriculture. A foreword to the programme says:—

"This Conference has been called to consider the place of agriculture in the economy of the United Kingdom and particularly to examine the part which home agriculture can, or should, play in providing for our future food requirements. At present approximately half our food comes from British farms and half is imported. In order to finance the production of home-grown food the nation spends over £200 million annually on agricultural subsidies, and to pay for the food we import absorbs over 40 per cent. of our export earnings. These facts raise questions of great national importance affecting our future.

"Imperial Chemical Industries Limited has therefore decided to hold this Conference to provide an opportunity for persons interested in agriculture, industry, banking and economics to express their views on the future of British agriculture and the directions in which it might be developed in the interests of the nation and the farmer."

We hope to publish a short review of the Conference in due course.

CHIEF V.O. TO THE ROYAL SHOW

Mr. Howard Dawes, C.B.E., has been appointed Chief Veterinary Officer for the Royal Show. He succeeds Mr. Brennan de Vine, who has retired from the position after 33 years' service to the Show.

UNIVERSITY NEWS

Edinburgh

The following appointments to the academic staff are announced:—

Department of Veterinary Anatomy, Mr. P. H. Hutton, M.R.C.V.S., Assistant; Department of Veterinary Bacteriology, Mr. John B. McFerran, B.SC., M.R.C.S., Assistant; Department of Veterinary Pathology, Mr. John C. Whitney, M.R.C.V.S., Lecturer; Department of Veterinary Physiology, Mr. H. Lundy, B.SC., Lecturer.

It is also announced that the Wellcome Trust has made a grant of up to £35,000 for the rebuilding of animal houses at the Institute of Animal Genetics.

THE B.V.A. AUTUMN CONFERENCE

May we remind readers of the application form for admission to this conference, which was circulated with THE RECORD a fortnight ago? We are asked to say that the General Secretary's office would be glad to receive completed forms as soon as possible from those who wish to attend. Copies of the papers to be read, together with tickets of admission, will be forwarded to applicants nearer the time of the conference.

EXCHANGE OF CORRESPONDENCE

The children of French veterinary surgeons are once again asking for British correspondents, and details are as follows:—

A girl living in Meymac (Corrèze) would like to write to an English girl 16 years of age, preferably in or near London.

A 15-year-old French girl living in Algeria, and a 14-year-old French girl living in the Indre-et-Loire department of France, are also seeking British pen-friends.

Readers who may be pleased for their children to correspond with those of French colleagues are asked to notify the General Secretary of the B.V.A.

"McKERRELL'S JOY"

Behind the name of a prize-winning cat lies an interesting story of how the animal got its name. A Staffordshire veterinary surgeon, Mr. A. McKerrell, succeeded after much difficulty in saving the life of a valuable Siamese cat, owned by Mrs. D. Powell, of Haughton. In gratitude she decided that all its kittens should bear his name. One of them, McKerrell's Joy, has won no fewer than 21 first prizes during the past six years. Its latest achievement was the gaining of five first prizes in the Midland Counties Cat Show, in Birmingham.

MR. GEORGE BUDGE

We announce, with regret, the sudden death, at his home, of Mr. George Budge.

Mr. Budge, who was 69 years of age, was the third son of the late Mr. James Budge, farmer, and the late Mrs. Budge of Wick. He was educated at Pulteneytown Academy and later studied at Edinburgh, where he graduated in 1908.

He started practice in Exeter but on the outbreak of the First World War he went on active service with the R.A.V.C., being attached to a Canadian brigade. He was commissioned and rose to the rank of captain and was mentioned in despatches.

Returning to Caithness after the war, Mr. Budge set up practice and became widely known for his skill as a veterinary surgeon. He was the oldest practitioner surgeon in the county.

Always a keen sportsman—he played football for the "Dick"—he was a skilled horseman, and in his youth was a prominent competitor at equestrian events. In later years he was much sought after as a judge at gymkhanas. He also judged the light-legged horse section at various district shows. For many years he was a leading member of Caithness Agricultural Society and his services on the show committee were highly appreciated.

His sudden passing is deeply regretted by his many friends in the county and elsewhere in the north of Scotland, for he was universally popular and esteemed.

Mr. Budge is survived by his wife to whom, with other relatives, deep sympathy is extended in their sudden bereavement.

The funeral, which took place in Latheron Churchyard, was very largely attended, mourners coming from all parts of the county. The Rev. A. A. Roy conducted the service at the house, assisted by The Rev. A. S. Maciver.

DR. LEUNIS VAN ES

Mr. O. V. Gunning writes:—

One early November afternoon in 1908, at the beginning of the winter freeze-up, the writer walked from a prairie farm to enrol as a student at The North Dakota State Agricultural College. At the bottom of the stairs leading to the Dean's office, he stopped to enquire the way of a cultured, kindly man, little thinking at the time this chance meeting was the commencement of a 48-year friendship.

The informant was Leunis Van Es, whose passing removes from the profession one of those later pioneers whose vision and energy carried on to a solid foundation the work so ably begun by such men as James Law of Cornell and a handful of others on each side of the North American border.

It was in 1903 that Van Es was persuaded to go to North Dakota State College, Fargo, as head of the Department of Veterinary Science, and State Veterinarian. On arrival he found conditions which would have daunted any lesser man. As he used to relate, the sole equipment was a mouth gag and tooth rasp. Infectious disease was rife, and the law under which it operated was ineffective. After a painstaking study of live-stock control methods in the older States, he drafted a new Live-stock Bill, which later became a model for other states to follow. Vested interests and ignorance in a new state made the

passage of the Bill very difficult, and it was not until 1907 that the Live-stock Sanitary Board was finally established. During this time, however, things were not idle. A State Serum Institute had been established for the preparation of swine-fever vaccine (according to the method recently introduced by Dorset) and also for tuberculin and mallein. Van Es remained Bacteriologist and Consulting Veterinarian to the new Board until 1918.

During this period the eradication of scabies in cattle and sheep and dourine in horses was accomplished. Glanders was brought under control, and the eradication of tuberculosis was inaugurated. The most notable research during this period was on swamp fever in horses and on avian tuberculosis.

In 1918 Van Es became Chairman of The Institute of Animal Pathology, University of Nebraska, where his researches continued and he again brought honour to his institution. His knowledge of five languages enabled him to study the findings of scientists in other countries as well as to report some of his own research in their scientific journals.

He had an amazing capacity for work, but during the time the writer was actively associated with him he never saw Van Es flurried, angry, or in a hurry. His was an outstanding personality which endeared him to veterinarians, students, and stockmen alike, and enabled him to surmount the acute opposition of his pioneer days in Dakota. As a veterinarian he has been fully acclaimed by his own countrymen and has been the recipient of many honours. The writer, then a stranger in a strange land, remembers him most for his extreme kindness, humanity, and inspiration.

FOOT-AND-MOUTH DISEASE

Restrictions on the movement and marketing of live-stock in the Infected Area around Daventry, Northants, were withdrawn as from October 30th, 1956.

The four outbreaks in this Area involved the slaughter of 229 cattle, 525 sheep, and 25 pigs.

IN PARLIAMENT

Quarantine Restrictions for Rabies

SIR IAN FRASER (October 29th) asked the Minister of Agriculture, Fisheries and Food if he will consider the adoption of inoculation against rabies in place of the present method of quarantine for dogs, etc.

MR. AMORY: Inoculation would not be a safe substitute for quarantine since it cannot be relied upon to confer complete immunity against rabies.

SIR I. FRASER: Does not my right hon. Friend think that he and his Department are being very old-fashioned about this? Do not many countries rely, with virtual security, upon inoculation?

MR. AMORY: No; I am afraid that I could not agree with my hon. Friend there. Vaccinated dogs have contracted rabies on a number of occasions, and I think it is significant that the World Health Organisation quite recently recommended that those countries which are at present free of rabies should not rely solely upon vaccination but should go in for the policy which we follow, namely, of quarantine.

MR. GRANT-FERRIS: Will my right hon. Friend undertake never to relinquish these regulations about quarantine until much greater strides have been made with inoculation? Will he also remember that there is too much of a tendency for the dog to be regarded as a " sacred cow "?

MR. AMORY: Without following my hon. Friend too far with the analogy he made at the end of his supplementary question, I would say that I agree that this is a matter upon which it would be really silly to take risks. The amount of suffering which could result from a single outbreak of rabies in a dog is very considerable indeed, and I do not intend to take the smallest risks in this matter.

Vibrio coli

MR. GOUGH (October 29th) asked the Minister of Agriculture, Fisheries and Food whether he will consider taking steps to have *Vibrio coli* classified as a notifiable disease.

MR. AMORY: I am advised that this particular form of diarrhoea in pigs cannot readily be distinguished from others, and, indeed, it is only after elaborate tests that a clear positive diagnosis can be established. In the circumstances, no useful purpose would be served by making it notifiable.

MR. GOUGH: Does not my right hon. Friend agree that the experts know very little about this disease? Will he bear in mind the experience of one of my constituents who, not long ago, suffered a catastrophic financial loss owing to the advice given by my right hon. Friend's technical friends to slaughter the whole of his herd because they knew nothing about *Vibrio coli*?

MR. AMORY: As far as the first part of my hon. Friend's question is concerned, I agree that there it still a lack of detailed information about this disease, but as regards the second part, I could not acknowledge for a minute that the serious loss caused to my hon. Friend's constituent—and I agree that it was a serious loss, and I am very sorry for it—was in any way due to advice received from my Department.

MR. GOUGH: Does not my right hon. Friend agree that this may be a new and terribly serious disease which has come into this country? Will not he at least tell the House that his officials are giving it the fullest possible consideration?

MR. AMORY: I gladly do that. A great deal of work is being done upon this disease in several of our institutes in this country.

PERSONAL

Births

BOYDE.—On October 27th, 1956, at the Bearsted Memorial Hospital, Hampton Court, to Pamela (*née* Bell), wife of Carl Boyde, M.R.C.V.S., 2a, Shelson Parade, Ashford Parade, Feltham, Middlesex, a daughter, Elizabeth.

CASPARI.—On October 27th, 1956, at Rose Hill, Dorking, to Margaret, wife of Ernest Caspari, M.R.C.V.S., of Whyteleafe, Leatherhead, a daughter, Georgina Mary.

MEARS.—On October 8th, 1956, to Wendy, wife of R. H. Mears, M.R.C.V.S., of 19, Hill Mead, Horsham, Sussex, a son, Simon Richard.

TAYLOR.—On October 17th, 1956, at Columbia Hospital, Milwaukee, Wisconsin, U.S.A., to Jean, wife of Philip E. Taylor, M.R.C.V.S., of 509, Geneva Street, Delavan, Wisconsin, a son, Maynard James, brother for Gail, Richard, and Valerie.

WILSON.—On October 16th, 1956, to Doris, wife of Jack Wilson, M.R.C.V.S., of Primrose Cottage, Woodland Avenue, Teignmouth, Devon, a son, Alan Graham.

Marriage

HASTIE—MCCATHIE.—At Craiglockhart Parish Church, Edinburgh, on October 27th, 1956, Hamish Hastie, M.R.C.V.S., Edinburgh, to Laura Masterton McCathie, Edinburgh.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

LEWIS, Harry P., of 51, Lodge Street, Hull, Yorks. Graduated London July 15th, 1903. Died October, 8th, 1956.

COMING EVENTS

November

7th (Wed.). Meeting of the Scottish Regional Group of the A.V.T. and R.W's. in the Lecture Room of the Department of Pathology, The Royal (Dick) School of Veterinary Studies, Edinburgh, 2.15 p.m.

Annual General Meeting of the North Wales Division, B.V.A., at the Gwydyr Hotel, Bettws-y-Coed, 2 p.m.

9th (Fri.). Annual General Meeting of the Royal Veterinary College Association at 4.30 p.m.

14th (Wed.). General Meeting of the Scottish Metropolitan Division, B.V.A., at the Royal (Dick) School of Veterinary Studies, Edinburgh, 4.30 p.m.

General Meeting of the Lancashire Division, B.V.A., at the University Veterinary Hospital, Liverpool, 2.30 p.m.

15th (Thurs.). Autumn Meeting of the Eastern Counties Veterinary Society at the Suffolk Hotel, Bury St. Edmunds, 11.45 a.m.

Meeting of the Essex Veterinary Society at the Institute of Agriculture, Writtle, Nr. Chelmsford, Essex, 7.30 p.m.

16th (Fri.). Dinner-Dance of the Yorkshire Division, B.V.A., at the Royal Station Hotel, York.

22nd (Thurs.). Annual Dance of the Victoria Veterinary Benevolent Fund, County of Ayr Ladies' Guild at Western House, Ayr, 8 p.m.

22nd and 23rd (Thurs. and Fri.). B.V.A. Conference on Supplements and Additives in Animal Feedingstuffs at the Victoria Halls, Bloomsbury Square, London, W.C.1.

26th (Monday.). Annual Dinner of the Centaur Society at the Grand Hotel, Bristol, 7 p.m.

30th (Fri.). Ordinary General Meeting of the Royal Counties Division, B.V.A., at the Caversham Bridge Hotel, Reading, 2.30 p.m.

B.V.A. COMMITTEE AND COUNCIL MEETINGS IN LONDON

Wednesday, November 7th, at 7, Mansfield Street

10.00 a.m. Veterinary State Medicine Committee.
12.00 noon Parliamentary and Public Relations Committee.
2.15 p.m. Farm Live-stock Committee.
4.00 p.m. Home Appointments Committee.

Thursday, November 8th, at 7, Mansfield Street

10.00 a.m. Small-Animals Committee.
12.00 noon Finance Sub-committee.
2.00 p.m. General Purposes and Finance Committee.

Friday, November 9th, Connaught Rooms, Gt. Queen Street

10.30 a.m. Meeting of Council.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Ayr. Cockhill Farm, Ayr (Oct. 22).

Ches. Battersby Farm, Hazel Grove, Stockport (Oct. 22); Fields Farm, Lower Peover, Knutsford; Shavington House Farm, Shavington, Crew (Oct. 23).

Kirkcudbright. West Preston, Kirkbean, Dumfries (Oct. 19).

Lancs. Higher Moss Side Farm, Moss Side Lane, Moore, Warrington (Oct. 24).

Lincs. The Mill, Claypole, Newark (Oct. 20)

Yorks. Mitton Old Hall, Mitton (Oct. 22).

Fowl Pest

Lancs. North Dene, Newsham Lane, Woodplumpton; Mays Farm, Plox Brow, Tarleton; Lightfoot Green Farm, Lightfoot Lane, Broughton, Preston (Oct. 19); Rushmore, Shirley Lane, Longton, Preston (Oct. 20); Broughton Hall Farm, Durton Lane, Broughton; New Lane Poultry Farm, Eccleston, Chorley; 4, Acres, Drumacre Lane, Longton (Oct. 23); Highcroft Poultry Farm, Gill Lane, Longton; Hazeley House, Newsham Lane, Woodplumpton, Preston (Oct. 24); 33, Canterbury Street, Chorley; The Mount, Mayfield Avenue, Ingol; Woodcock Farm, Wigan Road, Leyland.

Swine Fever

Essex. The Piggeries, Malden Road, Margaretling, Ingatestone (Oct. 25).

Glamorgan. Fairoak Farm, Lake Road East, Cardiff (Oct. 26).

Lanark. Neiliain Piggery, Moodiesburn (Oct. 29).

Monmouth. Hawse Farm, St. Brides, Wentloog, Newport (Oct. 25); Dingle Cottage, Maesglas (Oct. 26).

Norfolk. Orchard Farm, Dickleborough, Diss (Oct. 29).

Somerset Poole Farm, Sandford, Bristol (Oct. 24); Costello Buildings, Yeovilton Road, Yeovilton, Yeovil; Stone Pit Lane, Limington Road, Ilchester (Oct. 29).

Warwick. Woodlands Farm, Wootton Green Lane, Balsall Common, Coventry (Oct. 23).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

A B.V.A. Research Journal?

Sir,—I wonder whether the time has not come for THE VETERINARY RECORD to consider dividing itself into one and a half? Major Hamilton-Kirk's letter of January 28th, 1956, drew attention to the fact that THE RECORD has become very "high brow," devoting a lot of space to technical articles full of tables. That there is a need for all types of articles there is no question of doubt. Is THE VETERINARY RECORD the right vehicle, however, to carry some of them? Would not perhaps the monthly or quarterly publication of a "B.V.A. Journal of Veterinary Research" be the answer to critics?

Yours faithfully,

J. H. WILKINS,
Major Commandant.

(Editor of the "Journal of the Royal Army Veterinary Corps.")

R.A.V.C. School and Stores,
Thornhill,
Aldershot,
Hants.

October 25th, 1956.

"Looking Forward"

Sir,—I am proceeding abroad in a few days and I consider myself fortunate, before leaving, to have received my copy of THE VETERINARY RECORD of October 27th, which contains a reprint of the address given by Sir William Slater to the students of the Royal Veterinary College at the opening of their new session.

Although I have been a member of the profession now for a number of years, I cannot remember ever reading an address which stated so admirably the proper place of the veterinarian in the social economy of any country, and, assuming that this message from a distinguished member of another profession is received in the helpful way in which it is evidently meant, one which gave me so much hope for the future.

I have no doubt many others, like myself, have been irritated in the past by hearing the veterinary profession described as the younger sister of the profession of human medicine or the handmaid of agriculture. It has been obvious for a long time that the veterinary profession has a most important mission of its own to fulfil, and, while some have already done so, it is time to say that the profession as a whole has not yet taken up the torch which, as Sir William Slater so aptly points out, is being offered to us.

My only criticism of the way in which this address has been presented, Mr. Editor, is in the caption you have given to it. To prepare ourselves for the larger range of duties visualised by Sir William Slater is an immediate task, and I am firmly convinced that what the public and many administrators need now, not in some unnamed number of years, is a veterinarian who, in the words of Sir William, is not someone to be called in only in an emergency, but one who can maintain the health and increase the productivity of our flocks and herds, upon which mankind depends.

Yours faithfully,

FRANK WARE.

Springfield,
Highclere.

October 28th, 1956.

Hip Condition in Man and Animals

Sir,—For several years I have been engaged in a study of the hip condition in children known commonly by the names of coxa plana, osteochondritis of the hip, Perthes disease, or Legg-Calve-Perthes disease. I have seen some references to a similar condition existing in the hips of terriers—fox terriers, Cairn terriers, and Irish terriers. Up until recently we thought that only the Danish pig had been supposed to suffer from this disorder which, by the way, in man is not related to the condition we recognise as slipped epiphysis.

As for the prosecution of our work it would be extremely important to be able to study the vascular pattern of the hips of terriers suffering from this condition, we should be extremely grateful if any veterinary surgeon with such an animal under his care could communicate with us.

Yours faithfully,

J. TRUETA,
Nuffield Professor of Orthopaedic Surgery.

Nuffield Orthopaedic Centre,
Oxford.

October 27th, 1956.

Monozygous Twins

Sir,—I am grateful to Mr. L. E. A. Rowson for his letter in your issue of October 20th in which he records his observation of a biovular follicle. I had not been able to find any reference to this occurrence in cattle, although it has been found in many other species, including sheep. The important and intriguing question is, of course, do these biovular follicles of cattle mature and discharge two viable eggs? Perhaps Mr. Rowson knows the answer.

Yours faithfully,

G. H. ARTHUR.

Royal Veterinary College and Hospital,
Field Station,
Streatley House,
Streatley,
Berks.

October 30th, 1956.